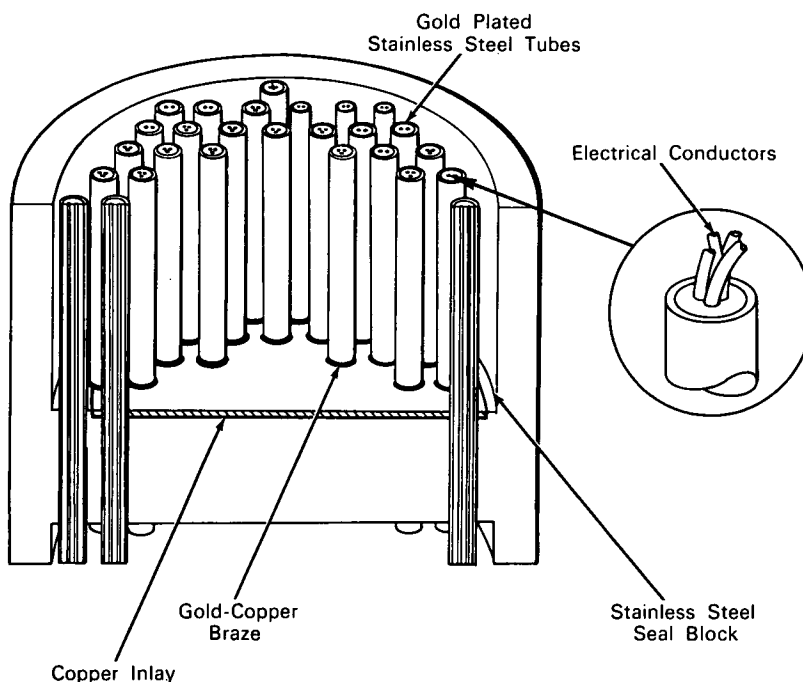


# NASA TECH BRIEF



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## Coating Method Enables Low-Temperature Brazing of Stainless Steel



**The problem:** To braze stainless steel tubes, containing insulated electrical conductors, to a stainless steel sealing block. The braze must be made at a temperature that will not damage the conductors but must provide an effective seal against gaseous or liquid helium under pressure.

**The solution:** One stainless steel surface is coated with gold, the other with copper, and the braze is accomplished with a gold-copper (phosphorous) eutectic.

**How it's done:** The sealing block is prepared as a copper-stainless steel composite by pressure inlaying of copper in the seal area. Holes are bored to accommodate the tubes, a very thin gold plate is applied to

each tube and the tubes are inserted in the block. The Ag-Cu eutectic is placed in position and a small induction furnace is slipped over the completed assembly. An inert gas is introduced to prevent oxidation, and a 10-kc/s frequency is used to effect the braze.

### Notes:

1. The 10-kc/s frequency is used instead of the normal 440 kc/s to assure simultaneous brazing of the inner and outer joints.
2. This technique provides a highly effective seal without the use of flux and without damage to the electrical conductors inside the tube.

(continued overleaf)

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
AEC-NASA Space Nuclear Propulsion Office  
U.S. Atomic Energy Commission  
Washington, D.C., 20545  
Reference: B65-10250

**Patent status:** NASA encourages commercial use of this innovation. No patent action is contemplated by NASA.

Source: F. D. Seaman of  
Westinghouse Astronuclear Laboratory  
under contract to  
Space Nuclear Propulsion Office  
(NU-0030)